WE CLAIM:

- A perpendicular magnetic head comprising:
- a magnetoresistike read device positioned to read perpendicular residual magnetic fields on a magnetic media in proximity with the read device;
- a shield at least partially surrounding the read device comprising | a magnetic material having orientation selected to capture stray magnetic fields; and
 - a transverse magnetic bias field within the shield.
- magnetic head of 2. claim 1 wherein the transverse magneti \boldsymbol{k} field is in the range of 30-500 Oe.
- madnetic head of claim 1 transverse magnetic bias is applied by exchange pinning technique.
- The magnetic head of claim 1 wherein the transverse magnetic bias is applied by field anneal to induce magnetoctystalline anisotropy.
- magnetic head of claim 1 wherein 5. The 20 transverse magnetic bias is applied by stress-induced magnetocrystal ine anisotropy.
 - The magnetic head of claim 1 wherein the read device comprises a giant magnetoresistive device.
 - 7. A perpendicular magnetic write head comprising:
- 25 a magnetbresistive write device positioned to write perpendicular residual magnetic fields on a magnetic media in proximity with the write device;
 - a shiel ϕ at least partially surrounding the write magnetic material device comprising a having orientation selected to capture stray magnetic fields; and
 - a transverse magnetic bias field within the shield.

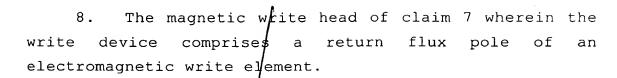
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- 9. The magnetic write head of claim 7 wherein the transverse magnetic field is in the range of 30-500 Oe.
- 10. The magnetic write head of claim 7 wherein the transverse magnetic bias is applied by exchange pinning technique.
- 11. The magnet c write head of claim 7 wherein the transverse magnetic bias is applied by field anneal to induce magnetocrystalline anisotropy.
- 12. The magnetic write head of claim 7 wherein the transverse magnetic bias is applied by stress-induced magnetocrystalline anisotropy.
- 13. The magnetic write head of claim 7 wherein the read device comprises a giant magnetoresistive device.
 - 14. A magnetic data storage device comprising:
 - a perpendiqular recording medium;
 - a read/write head;
- drive electronics coupled to position the read/write head over selected locations of the perpendicular recording medium;
 - a read element within the read/write head;
 - a write #lement within the read/write head;
- a shield at least partially surrounding the read device comprising a magnetic material having an orientation selected to capture stray magnetic fields; and
 - a transverse magnetic bias field within the shield.
- 30 15. A method for reducing flux concentrating capacity of a shield, said shield at least partially



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surrounding a magnet resistive read device positioned to read perpendicular residual magnetic fields on a magnetic media, said method comprising:

reducing permeability of said shield in a direction oriented perpendicular to said magnetic media by inducing a transverse magnetic bias field within said shield.

- 16. The method of claim 15, wherein said step of inducing a transverse magnetic bias field within the shield further comprises inducing said transverse magnetic field bias within said shield by an exchange pinning technique.
- 17. The method of claim 17, wherein said step of inducing a transverse magnetic bias field within the shield further comprises inducing said transverse magnetic field bias within said shield by field anneal to induce magnetocrystalline anisotropy.
- 18. The method of claim 17, wherein said step of inducing a transverse magnetic bias field within the shield further comprises inducing said transverse magnetic field bias within said shield by stress-induced magnetocrystalline anisotropy.

Add BI)

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